1 321 081

# PATENT SPECIFICATION

(11) 1 321 081

DRAWINGS ATTACHED

(21) Application No. 3057/70 (22) Filed 21 Jan. 1970
(23) Complete Specification filed 5 Jan. 1971
(44) Complete Specification published 20 June 1973
(51) International Classification A47L 11/32//A46B 9/00
(52) Index at acceptance
A4K 2A7A 2B7 2C2X 2CX
A4F 7
(72) Inventor HAROLD HORNER

## (54) CARPET SWEEPERS HAVING ROTARY BRUSHES

(71) We, THE PRESTIGE GROUP LIMITED, a British Company of Prestige House, 14—18 Holborn, London E.C.1. do hereby declare the invention for which we pray that a Patent may be granted to us and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to carpet sweepers having rotary brushes.

Conventional carpet sweepers are made with circular rotating brushes but all the tufts are usually of the same length and have the same flex characteristics. The brushes are usually made from either a wood or plastics material stock or body into which tufts are fitted. In another form of construction the centre of the brush consists of twisted wires which lock continuous rows of bristle in place.

The Applicants have found that the sweeping properties of a rotary carpet sweeper brush can be improved by using a brush having sweeper elements, such as tufts, of different flex characteristics.

According to the present invention in a carpet sweeper having a rotary brush which is rotated by manual operation of the sweeper over a supporting surface, the sweeper brush comprises a plurality of outwardly extending sweeper elements arranged in a number of rows extending along the brush to contact and sweep the supporting surface as they pass over it, the sweeper elements being of different flex characteristics and arranged around the circumference of the brush in spaced apart relationship with a soft flex sweeper element preceding a stiffer sweeper element in the direction of rotation and positioned to receive dirt swept forward by said stiffer element.

It has been found that by using a brush of the kind set forth better sweeping action is obtained on hard surfaces such as wood and linoleum floors than with a conventional carpet sweeper brush and it is thought that the "soft" sweeper elements deflect on the floor and act as a seal which serves to prevent dust and other matters to be swept up from being pushed forward under the dust pan instead of being picked up into it. It has also been found that carpet sweepers having a brush according to the invention will sweep carpets better than a conventional brush as the "stiff" sweeper elements pick up bits in the normal manner, while the milder action of the "soft" sweeper elements cleans the surface of the pile better than a conventional carpet sweeper.

In a preferred embodiment the soft sweeper elements project radially outwardly beyond the stiffer sweeper elements.

In one preferred construction each row consists of a number of sweeper elements of the same characteristics whereas, in another suitable construction each row consists of a number of sweeper elements of different flex characteristics so that part of the length of the rows is "soft" and the other part "stiff."

Preferably the sweeper elements are tufts made from bristles and/or fibres and in the present specification the term "soft tufts" will be used to indicate tufts having a soft flex characteristic and the term "stiff tufts" will be used to indicate tufts having a stiffer flex characteristic.

In one convenient construction the soft tufts include less bristles or fibres than the stiff tufts.

In another arrangement the soft tufts are longer than the stiff tufts and in this construction the soft tufts may be connected to a brush hub at points at a smaller diameter than the diameter of the connection points for the stiff tufts.

Yet again, the soft tufts may be made from a different material from the stiff tufts. Thus, the stiff tufts may be made from bristle and the soft from synthetic fibres or horse hair.

If desired the sweeper elements can be carried on a hub in helical rows in well known fashion.

The invention may be performed in many

ways and some preferred embodiments will now be described by way of example and with reference to the accompanying drawings in which:—

Figure 1 is a cross sectional side elevation of a sweeper brush incorporating the invention, and

Figures 2, 3 4 and 5 are cross sectional side elevations of alternative constructions embodying the invention.

In the first arrangement to be described and as shown in Figure 1 the rotary carpet sweeper brush comprises a cylindrical hub 2 into which are connected longitudinally extending rows of tufts each of which acts as a sweeper element. Four of the rows, which are at right angles to each other are formed from short stiff tufts 3. The other four rows which are arranged alternately between the stiff rows and at 45° to them are made up from long thin tufts 4. The length of the long thin tufts 4 is greater than the short stiff tufts 3 so that they project radially outwardly beyond them and have a softer flex characteristic.

When a brush of this kind is mounted in a carpet sweeper it has been found that it provides a good sweeping action on a hard surface because the long thin tufts 4 which are "soft" deflect on the floor and act as a seal which serves to prevent dust and other matters which are being swept up from being pushed forward. The long soft tufts 4 also act to clean the surface of the pile when the sweeper is used on a carpet.

It will be appreciated that any other number of rows of tufts could be used and if desired the rows could be carried on the hub in helical rows.

In the next arrangement to be described and as shown in Figure 2 the hub 22 is provided with three longitudinally extending grooves 21. Three rows of long thin tufts 24 are carried on the hub 22, each row being mounted in one of the grooves 21 and short stiff tufts 23 are carried in three rows alternately between the rows of long thin tufts 24. The short stiff tufts 23 are of shorter lengths than the long thin tufts 24 and are mounted on the hub at points of greater diameter than the long thin tufts 24 which are carried within the grooves 21. With this arrangement the smaller diameter of the mounting points of the long thin tufts 24 enables even longer tufts to be used so that they have a soft flex characteristic to provide the desired effect.

In the third arrangement to be described and as shown in Figure 3 the rows of tufts are all mounted at points at the same diameter, but in this arrangement each row is made up of a number of tufts of different flex characteristics so that part of the length of the rows is "soft" and part "stiff". The rows are arranged so that the part of the length of each row which is "soft" is immediately followed by a length of "stiff" tufts in the following row around the circumference of the brush in the direction of intended rotation thereof when in use. Thus, a similar effect to that which has previously been described is obtained. In the arrangement shown lengths of long soft tufts 34 are spaced between lengths of short stiff tufts 33 along the length of each row and the rows are arranged in a helical fashion on the hub 32, but in order to make the drawing more clear only two lengths of tufts of different flex characteristics in each row are shown.

The stiff and soft characteristics of the tufts can be obtained in many ways, for example, as shown in Figure 4 in which all the tufts are the same length, they can be made of different materials such as bristle for the stiff tufts 43 and synthetic fibres or horse hair for the soft tufts 44, or the effects can be obtained merely by making the soft tufts longer as described with reference to Figures 1, 2 and 3 so that they have a softer flex characteristic, or any combination of these physical properties can be used. Again as shown in Figure 5 the flex characteristics can be effected by providing less bristles or fibres in the soft tufts 54 than in the stiff tufts 53.

It will also be appreciated that in certain circumstances it may be preferable to provide two or more rows of stiff tufts in between each row of soft tufts, depending upon the characteristics of the sweeper brush required.

In the arrangement described above tufts of bristles or fibres have been used to provide the sweeper elements but alternative material such as felt could be used to carry out the invention provided the required flex characteristics are achieved.

WHAT WE CLAIM IS:—

1. A carpet sweeper having a rotary brush which is rotated by manual operation of the sweeper over a supporting surface, the sweeper brush comprising a plurality of outwardly extending sweeper elements arranged in a number of rows extending along the brush to contact and sweep the supporting surface as they pass over it, the sweeper elements being of different flex characteristics and arranged around the circumference of the brush in spaced apart relationship with a soft flex sweeper element preceding a stiffer sweeper element in the direction of rotation and positioned to receive dirt swept forward by said stiffer element.

2. A carpet sweeper as claimed in Claim 1 in which the soft sweeper elements project radially outwardly beyond the stiffer sweeper elements.

3. A carpet sweeper as claimed in Claims 1 or 2 in which each row consists of a number of sweeper elements of the same flex characteristic.

4. A carpet sweeper as claimed in Claim 1 or Claim 2 in which each row consists of a number of sweeper elements of different flex characteristics so that part of the length of the tow is "soft" and part "stiff".

5. A carpet sweeper as claimed in Claim 1 or Claim 2 in which the sweeper elements are tufts made from bristles and/or fibres.

6. A carpet sweeper as claimed in Claim 5 in which the "soft" tufts include less bristles or fibres than the "stiff" tufts.

7. A carpet sweeper as claimed in Claim 4 or Claim 5 in which the soft tufts are longer than the stiff tufts.

8. A carpet sweeper as claimed in Claim 7 in which the soft tufts are connected to a brush hub at points at a smaller diameter than the diameter of the connection points for the stiff tufts.

9. A carpet sweeper as claimed in any one of Claims 5, 6, 7 or 8 in which the soft tufts are made from a different material from the stiff tufts.

10. A carpet sweeper as claimed in Claim 9 in which the stiff tufts are made from bristle.

11. A carpet sweeper as claimed in Claim 9 or Claim 10 in which the soft tufts are made from synthetic fibres or horse hair.

12. A carpet sweeper as claimed in any one of the preceding claims in which the sweeper elements are carried on a hub in helical rows.

13. A carpet sweeper having a rotary brush substantially as described herein with reference to and as shown in Figures 1, 2, 3, 4 or 5 or any combination thereof of the accompanying drawings.

For the Applicants,
G. F. REDFERN & CO.,
Chansitor House,
38 Chancery Lane,
London W.C.2.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1973.
Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.

1321081 COMPLETE SPECIFICATION
1 SHEET This drawing is a reproduction of the Original on a reduced scale

FIG. 1

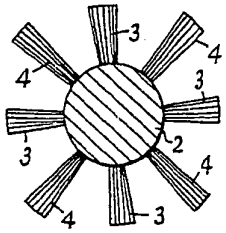


FIG. 2

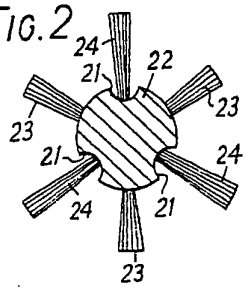


FIG. 3

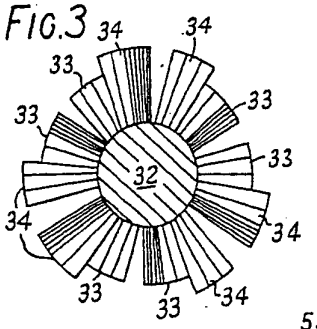


FIG. 4

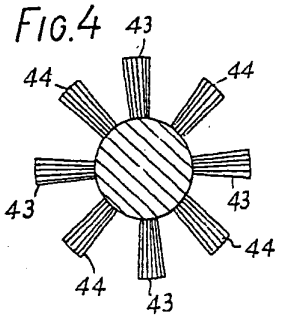


FIG. 5